The Effect of Depression on Lehigh Valley Health Network's Commercial and Medicare High-Risk COPD Population for Quality and Utilization Outcome Improvement

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The Effect of Depression on Lehigh Valley Health Network's Commercial and Medicare High-Risk COPD Population for Quality and Utilization Outcome Improvement

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Introduction

Approximately 17.8% of the US GDP in 2015 was spent on healthcare.[1] Notably, 5% of the patient population accounts for 50% of that healthcare spending.[2] There have been many initiatives set forth for reducing healthcare cost within many healthcare systems. Most healthcare groups focus on targeting the "hot-spotters" who are super utilizers;[3] however, the population that cannot be taken for granted are high-risk patients, defined as those who can be predicted to over-utilize in the future. Utilization in healthcare was defined as consumption of services or supplies, such as office visits, number of prescription drugs taken, or number of days hospitalized.[4] Within that subset of utilizers, about 6.4% of Americans, 15.7 million, have been diagnosed with COPD.[5] COPD was the fifth leading cause of death in the United States in 2015.[6] Previous studies have shown the link between depression and COPD, suggesting that individuals with chronic conditions, such as COPD, are more likely to have depression. They have also shown that depressive symptoms – including lack of sleep or fluctuating eating habits – have contributed to worsening dyspnea, increased COPD exacerbations, more frequent ED visits, and hospitalizations. This analysis aims to look at the effect depression has on the care and cost of Lehigh Valley Health Network's (LVHN) COPD population. As part of a secondary analysis, it will also look at the effect of insurance status (e.g., commercial or Medicare on the two cohorts (e.g., COPD patients with depression and COPD patients without depression).

Problem Statement

In LVHN's high-risk COPD population, what is the impact of depression on healthcare utilization and cost?

Methods

- A retrospective quality improvement analysis of two cohorts: LVHN's COPD population with depression (n= 12,802) and LVHN's COPD population without depression (n = 26,868), ages ranging from 21-106 for whom three years of data was collected (01/01/2014 -11/30/2017).
- The two cohorts were further compared by insurance providers (i.e., commercial and Medicare).
- The data was collected through healthcare intelligence software (e.g., Optum One) that pulled from electronic medical records and claims
- Gained buy-in at meetings with the Senior Medical Director of Population Health and Payer Relations, the Executive Director of LVPHO, and pulmonology care management leaders

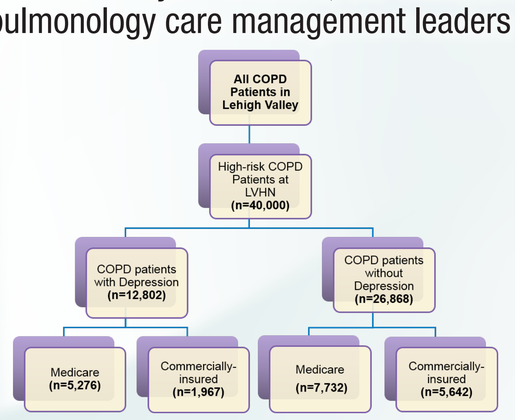

Figure 1: Closer look: COPD populations analyzed

Results

- This analysis suggested a positive correlation between depression and increased ambulatory visits, emergency visits, hospitalizations, and 30-day readmissions in COPD patients, regardless of insurance provider.
- This was reflected in increased costs for COPD patients with depression compared to those without.
- Medicare beneficiaries had increased utilization and cost compared to the commercially insured.
- This analysis also demonstrated a difference between the risk adjustment factor (RAF) between the COPD cohort without depression (average RAF of 1.012) and the COPD cohort with depression (average RAF of 1.552), signifying about a 53% increase. As the COPD severity worsened, the RAF score increased.

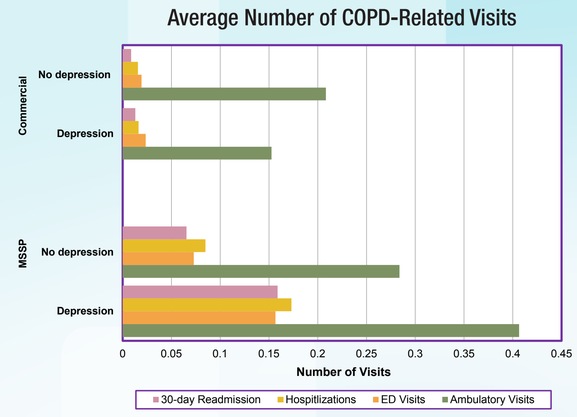

Figure 2: Average Number of COPD-related Visits. This figure demonstrates that in the MSSP population, the ambulatory visits, emergency visits, and hospitalizations, and 30-day readmissions were 43%, 115%, 104%, and 143% greater in patients with depression than without, respectively. In the commercially insured, the rates of emergency visits, hospitalizations, and 30-day readmissions were 22%, 4%, and 50% greater in patients with depression than without, respectively.

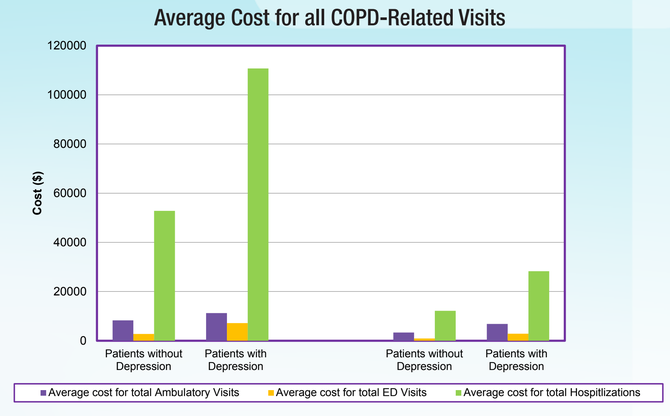

Figure 3: Average Cost for all COPD-Related Visits. In the MSSP population, cost for ambulatory visits, ED visits, and hospitalizations were 36%, 160%, and110% increased in patients with depression compared to those without, respectively. Likewise, in the commercial population, cost for ambulatory visits, ED visits, and hospitalizations were 105%, 213%, and 133% increased in patients with depression compared to those without, respectively.

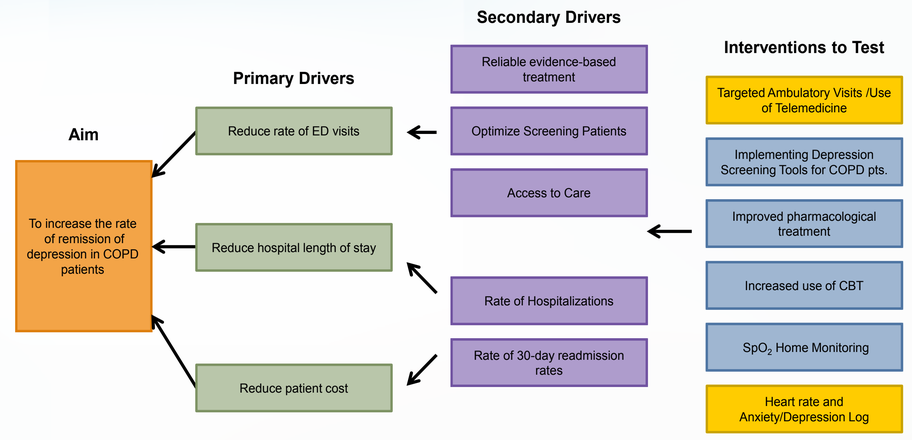

Figure 4: Driver Diagram for reduction of depression within the COPD cohort. The above diagram shows factors that interplay with why COPD patients with depression have increased utlization and cost, along with ideas on how to reduce these rates.

Conclusions and Future Work

There is a positive correlation between depression and increased health care utilization for patients with COPD, regardless of health insurance provider. Furthermore, Medicare beneficiaries with COPD and depression are at an even higher risk for increased utilization. In the future, further investigation of potential countermeasures, such as earlier diagnosis (e.g., increased PHQ-9 screening), improved treatment of depression, and adoption of innovative techniques (e.g., telemedicine) should be done to elaborate on ways of decreasing utilization and optimizing quality outcomes for the cohort of patients with COPD and depression.

This project mainly encompasses all three pillars of SELECT. In regards to healthcare, we strived to improve utilization outcomes by targeting high-risk COPD patients and looking at the relationship between those who have depression compared to those without. As the trend detected showed increased ED visits, hospitalizations and 30-day readmission rates in those with depression, the next discussion lies in whether these patients are satisfied with their quality of care and whether their care aligns with their values. Lastly, I personally grew as a leader through my communication skills, in my ability to influence others with data, in my ability to manipulate data on multiple software programs, and learn from others who have mastered topics I have not.

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